इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 14877-2 (2002): Hydraulic Presses - Straight Sided Columns/C-Frame Type, Part 2: Test Chart for Technical (Performance) Evaluation of Presses and Press Brakes [PGD 4: Metal Forming Machines]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

भारतीय मानक

द्रवचालित प्रेस — सीधे किनारे वाले कॉलम/सी-फ्रेम टाईप

भाग 2 प्रेस और प्रेस ब्रेक की तकनीकी (कार्यकारिता) के मूल्यांकन के लिए चार्ट

Indian Standard

HYDRAULIC PRESSES — STRAIGHT SIDED COLUMN/C-FRAME TYPE

PART 2 TEST CHART FOR TECHNICAL (PERFORMANCE) EVALUATION OF PRESSES AND PRESS BRAKES

ICS 25.120.10

© BIS 2002

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 2002

Price Group 2

Metal-Forming Machines Sectional Committee, BP 04

FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal-Forming Machines Sectional Committee had been approved by the Basic and Production Engineering Division Council.

This standard has been formulated based on manufacturing practices followed by manufacturers of presses in India.

The other part of this standard is:

IS 14877 (Part 1) : 2000	Hydraulic presses — Straight sided column/C-frame type: Part 1 Test chart for geometrical accuracy

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

HYDRAULIC PRESSES — STRAIGHT SIDED COLUMN/C-FRAME TYPE

PART 2 TEST CHART FOR TECHNICAL (PERFORMANCE) EVALUATION OF PRESSES AND PRESS BRAKES

1 SCOPE

1.1 This standard (Part 2) lays down guidelines for performance testing and technical evaluation for hydraulic presses and hydraulic press brakes.

1.2 It also deals with testing of the running of the press — such as vibrations, noise, etc, and also verification of the specification of the press.

2 REFERENCE

The following standard contains provisions which, through reference in this text, constitutes provision of this standard. At the time of publication, the edition indicated was valid. The standard is subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
14877 (Part 1) : 2000	Hydraulic presses — Straight sided column/C-frame type : Part 1 Test chart for geometrical accuracy

3 DIMENSIONS

The dimensional deviation of various slide movements of presses shall be as follows:

Sl No.	*Test Item*	*Allowable Deviation, Percent*
1.	Maximum stroke of slide (mm)	+10 0
2.	Maximum distance from upper face of bolster to lower face of slide (mm)	+10 0
3.	Maximum distance from upper face of the bed to the lower face of the slide (mm)	+10 0

4 MEASURING INSTRUMENTS

The measuring instruments shall be of approved type and shall be conforming to the relevant Indian Standard. The measuring instruments are to be provided by supplier.

5 TESTS

The performance evaluation consists of inspection of various geometrical parameters on functional aspects of the presses.

NOTES

1 The sequence of carrying out the tests may be changed to suit ease of mounting of measuring and testing equipments.

2 It is not obligatory on the part of supplier to give the production trial unless the buyer specifies it along with the order.

3 Full load trial on test blocks shall be performed by the supplier.

5.1 Geometrical Tests

Before conducting any performance test, all geometrical tests shall be completed according to IS 14877 (Part 1) and the machine level is not disturbed. If required, necessary anchorage may be provided.

5.2 Performance Test

The performance test comprises of the following:

a) Function test,
b) No load running test, and
c) Running test with load.

5.2.1 Such tests shall be carried out at supplier's premises. In case, few tests can not be performed at suppliers' premises, the same shall be demonstrated at customer's premises by any suitable means as per agreement between supplier and customer.

5.2.2 *Function Test*

During the function test, the hydraulic presses and/or hydraulic press brakes with necessary auxiliaries and the systems shall be run and the smoothness of action. The reliability of function shall be tested in accordance with the following method as applicable to them:

Sl No.	*Operation*	*Procedure*
1.	Press starting and stopping	Execute the starting and stopping operations three times consecutively to test the smoothness and reliability of action.
2.	Slide running	Execute the running operation three times

Sl No.	*Operation*	*Procedure*
		minimum consecutively to test the smoothness and reliability of action.
3.	Slide velocity adjustment	Execute the velocity adjusting operations for minimum and maximum velocity to test t he smoothness and reliability of action for minimum two times.
4.	Slide pressure adjustment	Execute the pressure adjusting operation for minimum and maximum settings.
5.	Slide stroke adjustment	Execute the adjustment operation for maximum stroke to test the smoothness and reliability of action.
6.	Slide stroke adjustment indicator	Test the accuracy of indication.
7.	Stroke-counter	Test the accuracy of indication.
8.	Moving bolster	Test the smoothness and reliability of action.
9.	Automatic die clamp	Test the smoothness and reliability of action.
10.	Die cushion/ ejector	Test the smoothness and reliability of action.
11.	Material feed mechanism, if applicable	Test the smoothness and reliability of action.
12.	Product feed mechanism, if applicable	Test the smoothness and reliability of action.
13.	Safety devices	Test the safety of parts such as gate, guard, sweep guard, pull back guard, two hand lever, two hand button and light beam type safety devices with regard to the operator.
14.	Secondary safety	Test the safety of parts such as restarting prevention mechanism, slide drop prevention, mechanism, emergency stop button, warning lamps, buzzer and ready-to-start button with respect to the operators.
15.	Oil pump/ grease pump pressure switch	Test the reliability of function
16.	Oil/grease supply	Test the efficiency of lubrication to all concerned parts
17.	Oil tightness	Test the oil tightness of the sliding parts and rotating parts.
18.	Pneumatic items such as filter regulator, pressure gauge, water separators, etc	Test the reliability of function.
19.	Pressure switch	Test the reliability of function.
20.	Air tightness	Test the reliability of function.
21.	Pressure gauge	Test the reliability of function.
22.	Liquid tightness	Test the reliability of function.
23.	Oil pressure regulating valves for over-load safety function	Measure the operating pressure at least three times and verify that it is within 120 percent of the maximum working pressure.
24.	Other overload prevention device	Test the reliability of machine protection
25.	Electrical device	Test the insulation once before and after the running test.

NOTES

1 Running operations refer to interrupted single stroke running, continuous running, continuous limited time running, inching and stopping according to its applicability.

2 Safety requirements for hydraulic presses shall be mutually agreed between the purchaser and the supplier.

5.2.3 *No Load Running Test*

5.2.3.1 No load test shall be conducted by executing interrupted single stroke running for minimum 500 strokes and continuous running of the press for minimum 4 h at maximum stroke with no load to check its electrical power requirement, temperature change and running conditions.

Measurement shall be taken only when the temperature shown by the temperature indicator remains in equilibrium.

Measurement shall also be for the initial descent during emergency stopping of the slide.

5.2.3.2 During no load test, measurement for the following shall be made after every one hour interval for listing as per **5.2.3.1** above.

a) Working velocity of slide maximum and minimum.

b) Electric power required by main motor during the pressing.

- c) Temperature of running parts mainly
    - 1) Motor driving the press at casing and bearings
    - 2) Pump
    - 3) Slide face
    - 4) Operating liquid media in the oil tank
- d) Air tightness — Test the reliability of function.
- e) Liquid tightness — Test the reliability of function.
- f) Vibration measurement1)
- g) Noise measurement1)

NOTE — The values of temperature, vibration and noise levels shall be as agreed between the manufacturer and the purchaser.

5.2.4 *Running Test with Load*

5.2.4.1 Load test shall be conducted by continuously running at maximum working pressure to check its temperature change and running conditions. The temperature at the measuring site shall be maintained constant during the test.

This test shall be conducted with respect to several combination of the slide stroke as given in **3**.

5.2.4.2 During load test measurement for the following shall be made:

- a) Temperature of casing and bearing of main motor driving the press and the operating liquid in the tank.
- b) Air tightness test for the reliability of operation.
- c) Liquid tightness test for the reliability of operation.
- d) Vibration measurement according to relevant Indian Standards
- e) Noise measurement according to relevant Indian Standards
- f) The duration of pressure application shall be reported as the time taken to the slide to travel half of the maximum stroke at pressing velocity as given in relevant Indian Standards and should be recorded as the following table:

6 TECHNICAL (PERFORMANCE) EVALUATION OF HYDRAULIC PRESSES AND HYDRAULIC PRESS BRAKES

6.1 The performance evaluation consists of inspection and testing of various geometrical parameters of the press for its reliability and efficiency. The procedure adopted may be changed by the supplier to suit the requirements of the press. The evaluation is only guideline for supplier and he shall ensure that the press meets the specification of customer.

6.2 During evaluation of hydraulic press/hydraulic press brakes following checks shall be made:

Sl No.	*Description*	*Check for*
1.	Bed fabrication	
1.1	Flatness tolerance	Top surface
1.2	Parallelism tolerance with reference to datum:	Slide bottom surface Cushion surface
2.	Bolster	
2.1	Flatness tolerance	Top surface Bottom surface Parallelism
3.	Slide	
3.1	Flatness tolerance, movement tolerance	Left to right with respect to bolster or bed Front to back with respect to bolster or bed
4.	Hydraulic systems	Check for the hydraulic system pipes as per the circuit Check for pump suction lines and the lines should be as short as possible with minimum bends

Sl No.	**Time of Measurement h & min**	**Temperature,°C**				**Stroke (mm)**	**Duration of Pressure Application (s)**	**Remarks**
		Main Motor Casing	Main Motor Bearing	Operating Liquid in Tank	Ambient Temperature			
1	2	3	4	5	6	7	8	9

---

1) Indian Standards under preparation.

Sl No.	*Description*	*Check for*
5.	Safety interlocks	Faulty lubrication/ machine lubrication faulty interlocks Systems safety interlocks Pumps safety interlocks Guards interlocks Cushion safety interlocks RUN buttons interlocks Motor overload interlocks
6.	Check for pipe joints	Leakage at joints Leakages at pumping station Leakage at manifold assembly station Leakage at cylinder ports Leakage at gauge box station Leakage at reservoir
7.	System parameters	Pressure setting on manifold blocks Specification of oil Contamination level of oil Direction of rotation of pumps Temperature of oil in power pack All hydraulic elements Pressure drop in the system
8.	Noise level	Measure noise level at operators position by running under maximum pressure as per Indian Standard. Shocks and vibration of the pipe lines during maximum pressure build up and decompression as per Indian Standard
9.	Lubrication	Check all lubrication points for proper lubrication and injectors to be set as per the lubrication chart.
10.	Reliability of hydraulic system	Run the machine continuously for eight hours without interruption in a programme consisting of all machine and system functions as per programme
11.	Reliability of pumps	Check for pump noise level under full load measuring from a distance one meter away from the pumping station (surrounding equipments and machines keeping idle) Leakage discharge, etc Check for temperature of pump at the end of 8 hours run Check for pump motor coupling alignment Manifold blocks reliability check at various pressure check points for pressure settings. The settings should remain same as before the commencement of 8 hours run
12.	Gauge box station	Check for pressure settings of various pressure control elements Vary the pressure settings from minimum/maximum and record the minimum and maximum values Check for provision for setting minimum and maximum and intermediate settings. Check for pressure gauges consistent readings Check for pressure gauges consistent readings

7 GENERAL CHECKING

7.1 The following general checking shall also be conducted:

- a) Piping as per circuit diagram,
- b) Accessibility of hydraulic equipment and piping and mounting or easy adjustment and maintenance of equipment,
- c) Identification of all the elements and equipments with labels,
- d) Correctness of pump motor alignment after complete assembly,
- e) Precision of proper clamping to all the pipes,
- f) Provision of dust seals to all the return and suction lines at the reservoir top, and
- g) Identification and marking of all piping as per circuit drawing.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. BP 04 (0015).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	323 76 17 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600 113	254 12 16, 254 14 42 254 25 19, 254 13 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE.
FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW.
NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.

Printed at Prabhat Offset Press, New Delhi-2